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## Lake McConaughy and Nebraska Piping Plover Recovery Goals

Mark M. Peyton, Senior District Biologist  
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Since 1992 the Central Nebraska Public Power and Irrigation District (Central) has protected and monitored nesting Piping Plovers along the shore of Lake McConaughy (Keith County, Nebraska). Over those 13 seasons, Central monitored 849 Piping Plover nests and documented the successful fledging (successful fledging is defined as a chick at least 24 days old, or one observed flying) of 1,237 Piping Plover chicks (Table 1), making Lake McConaughy one of the most productive nesting areas for Piping Plovers in Nebraska. The following is a documentation of the contributions of Lake McConaughy to the recovery goals for Piping Plovers in Nebraska.

### Piping Plover use of Lake McConaughy

On May 1, 2004, Lake McConaughy was at 39.7% capacity (633,100 ac/ft of a capacity of 1,594,100 ac/ft) with water elevation at 3217 feet above mean sea level. This is 26 feet lower than in 2002 and nine feet lower than 2003. While the steady decline in storage and elevation of the water in the reservoir is of serious concern, specifically for downstream water users and recreational fishermen, the large amount of exposed, sandy beaches has been ideal for nesting Piping Plovers. In terms of the number of adult birds sighted at the lake, the number of nests located and monitored, and the number of successfully fledged chicks, 2004 was a record-setting year, breaking the records set in 2003.

As part of its endangered species protection plan at Lake McConaughy, Central conducts weekly surveys of nesting Piping Plovers from late April through July. In 2004, a maximum of 168 pairs of adult Piping Plovers was counted. These birds were associated with 183 known nests, which produced 371 fledged chicks. The previous record numbers from 2003 were 111 pairs of adults, 118 nests, and 205 fledged chicks. (Table 1). Predictions for lake levels in 2005 suggest habitat conditions similar to those seen in 2004. Based upon these predictions it is expected there will again be extensive use of the beaches by Piping Plovers.

The lake will fill to capacity at some time in the future, as it did in 1995 and 1997, and those birds now nesting along the open beach will have to seek breeding areas elsewhere. Over the long term, the filling of the lake is essential for the continued use of the beach by nesting Piping Plovers because inundation of the beach removes the vegetation that is now encroaching upon the open sand. This acts to rejuvenate the habitat for nesting Piping Plovers in subsequent years.

### Piping Plover recovery in Nebraska

The U.S. Fish and Wildlife Service's (Service) Piping Plover Recovery Plan (U.S. Fish and Wildlife Service, 1988) identifies specific recovery goals for Nebraska including the maintenance of 250 adult pairs of Piping Plovers for the Missouri River adjacent to Nebraska and 215 adult pairs elsewhere in the state. The Service subdivided those Nebraska goals by allocating the need for 140 of the 215 pairs to the Platte River, 50 pairs to the Niobrara River and 25 pairs to the Loup River.

Table 1. Piping plover nest success at Lake McConaughy 1992 - 2004.

Year	# Adult Pairs	# Nests	Nest Hatched	Successful Nest	# Chicks	# Fledged	Fledge Success	Fledge Ratio
1992	53	66	46	70%	112	71	63%	1.34
1993	69	83	60	72%	172	110	64%	1.59
1994	46	50	35	70%	102	65	64%	1.41
1995	16	37	3	8%	7	6	86%	0.38
1996	44	60	16	27%	66	37	56%	0.84
1997	35	40	14	35%	55	17	31%	0.49
1998	18	25	9	36%	26	13	50%	0.72
1999	24	34	14	41%	34	24	71%	1.00
2000	29	33	29	88%	103	74	72%	2.55
2001	51	51	51	100%	181	112	62%	2.20
2002	67	69	67	97%	206	132	64%	1.97
2003	111	118	106	90%	308	205	67%	1.85
2004	168	183	168	92%	491	371	76%	2.21
Totals	731	849	618	72.8%	1863	1237	66.4%	1.69
Averages	56.2	65.3	47.5	63.5%	143.3	95.2	63.4%	1.43
SD	26.7	26.1	30.1	30.6%	88.2	59.4	13.2%	0.70

In a Service-sponsored workshop conducted in September of 2000 (Lutey, 2002) it was recommended that the 140-pair goal for the Platte River be further refined to allocate 77 pairs of birds between Columbus and the confluence of the Platte and Missouri Rivers (lower Platte), and 63 pairs between Lexington and Columbus (central Platte), with at least 16 of those pairs located between Lexington and Kearney. It was further recommended that Piping Plovers nesting along the shore of Lake McConaughy be counted toward the overall recovery goal for the species in the Great Plains, but not counted toward the Platte River goal because "...at the time the recovery plans were written, the recovery teams did not consider the South Platte or North Platte Rivers as central to recovery of the species." (Lutey, 2002).

A population can be defined as a group of individuals of the same species, living and reproducing in the same area. Piping Plover chicks banded in the central Platte River have subsequently nested as adults on the lower Platte and along the shore of Lake McConaughy (Wingfield, 1993). Thus, I would argue that the birds at the Lake and those along the Platte River in Nebraska are of the same population and all should be counted toward the same recovery goal.

The 168 pairs of Piping Plovers nesting this past year at Lake McConaughy represent 78% of the statewide and 120% of the Platte River recovery goals. Coupled with birds elsewhere along the Platte and throughout the state, these numbers may constitute the achievement of the Platte River and statewide population recovery goals for Piping Plovers for the second straight year.

Though the number of Piping Plovers nesting at Lake McConaughy coupled with the birds on the Platte and elsewhere in Nebraska represents potential recovery, the recovery plan also requires that population goals be met for 15 consecutive years.

When considering a broader scale and looking at populations throughout the Great Plains, maintenance of the recovered population for 15 consecutive years is an appropriate goal. However, in smaller geographic units it may be impossible to attain. Given the ephemeral nature of Piping Plover habitat on a smaller geographic scale, 15 consecutive years may not be realistic. Rivers on the Great Plains flood and dry up on cyclic intervals, as do their associated reservoirs and lakes. During these cycles of flood and drought, habitat is gained and then lost for some period. Piping Plovers are adapted to the ephemeral nature of their habitat. These birds relocate to different areas during unfavorable times. Thus, in some years they can be found in large numbers and successfully reproduce and in other years they may not be present at all. Knetter (et. al. 2002) pointed this out in regard to alkali lakes in the Northern Great Plains stating that Piping Plover habitat, and thus the number of birds present in an area, varies considerably year to year and that this variation needs to be considered in establishing recovery goals.

This considerable variation is common in Nebraska. Central documented population changes ranging from 16 pairs to 168 pairs along the shore of Lake McConaughy (Table 1). On the Missouri numbers of Piping Plovers ranged from 16 pairs to 138 pairs. On the Loup the population was reduced 62% in one year only to recover two years later (Table 2).

According to the average state-wide counts, as of 2001 we were at 61% of recovery within Nebraska not including the Missouri River (131/215 pairs), and 44% of

Table 2. Nebraska Piping Plover Survey Data (adult birds).

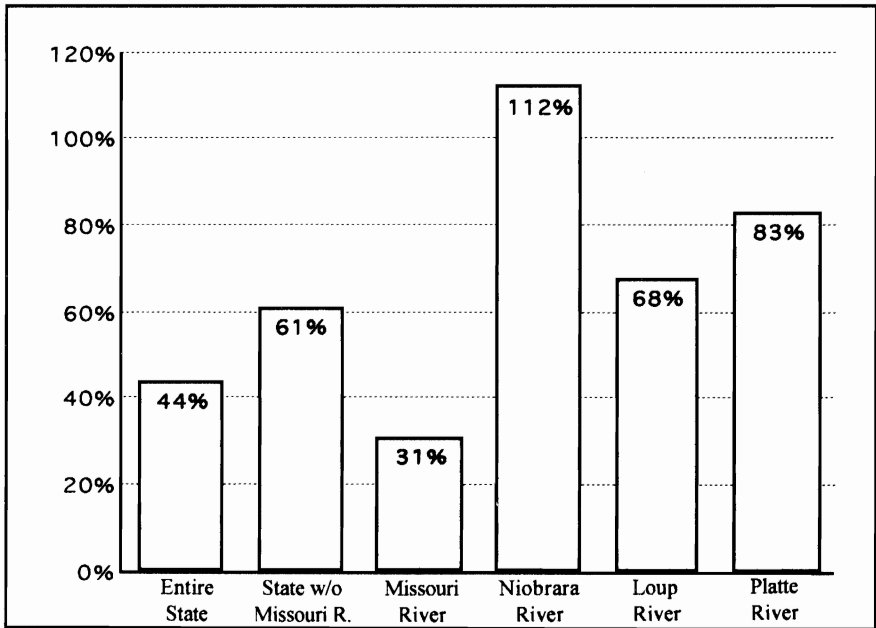
Year	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Estimated average (pairs*)
Missouri River	193	243	130	186	222	124	153	91	67	31	54	164	259	276	82	78
Niobrara River	126	83		162						107					17	56
Loup River		44		37		61	23		69	33	10	12			21	17
Elkhorn River						4	9	8	8	7	23			6	2	5
Upper Platte	0	2	0	8	7	8	9	10	8	24	14	14	10	8	2	4
Central Platte	87	56	87	54	67	67	56	62	39	55	34	34		33	30	27
Lower Platte	117	161	190	149	88	97	81	73		53	92	57		52	68	49
South Platte	2	5	6	1	0	0	1	0	0	2		5		6	2	2
Lake McConaughy				37	61	106	142	70	70	96	24	30	48	52	74	34
State Total	525	594	413	472	607	467	474	314	261	408	251	316	317	433	296	
Missouri Riv. Total	193	243	130	186	222	124	153	91	67	31	54	164	259	276	na	
Total of State without Missouri R.	332	351	283	286	385	343	321	223	194	377	197	152	58	157	296	

Source: Nebraska Game and Parks Commission Census Data 1987 - 2001 (unpublished)

\* Calculated as the average number of birds recorded divided by two

recovery for the entire state of Nebraska (209/465) (Figure 1). When the Nebraska Game and Parks Commission makes available the data for 2002 -2004, the three-fold increase in birds surveyed at Lake McConaughy, significant increases along the Missouri, and completed surveys of the Niobrara River and elsewhere will not only push the one-year totals above recovery goals for the state, but possibly the long-term averages as well.

Figure 1. Percent of Piping Plover Population Recovery Goals for Various Areas in Nebraska as of 2001



Source: Nebraska Game and Parks Commission Census Data  
1987 - 2001 (unpublished)

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